CARIBBEAN

FOOD

CROPS SOCIETY

31

Thirty First

Annual Meeting 1995

Barbados

Vol.XXXI

THE EFFECTS OF RUM DISTILLERY EFFLUENT ON SEED GERMINATION

Gobind Rameshwar[1] and Louis E. Chinnery[2]

[1] Marine Resources and Environmental Management Programme
[2] Department of Biology, The University of the West Indies,
P.O. Box 64, Bridgetown, Barbados.

Increased concerns about environmental pollution from poorly disposed industrial waste products and the increased need for sanitary landfills have led to the development of the concept that waste from one industry may be considered a resource for another. Since distillery effluent is a rich source of nutrients, its potential use in agriculture would seem obvious.

Pandey and Soni (1994) found that when distillery effluent was diluted to 10% with tap-water, germination of three multi-use tree species was promoted over a tap-water control. Germination of the species, *Acacia catechu* (L.f.) Willd., *Dalbergia sissoo* Roxb. ex DC and *Morus alba* L., was increasingly inhibited in greater effluent concentrations and no germination was observed in 100% effluent. These experiments, like ours, were conducted by placing seeds on moistened filter paper in sterile petri dishes. However, we used distilled, rather than tap-water as the diluent and control.

Effluent was obtained from the Mount Gay rum distillery, St Lucy, Barbados. Controlled environment (30 °C) germination tests were conducted using serial dilutions, with distilled water. Seeds of carrot (*Daucus carota* L. cv. Karoda and cv. Chantenay), onion (*Allium cepa* L. cv. Arad), beet (*Beta vulgaris* L. cv. Detroit dark red), parsley (*Petroselinum crispum* (Mill.) Nym. cv. Moss curled), melon (*Cucumis melo* L. cv. Honeydew green flesh), cabbage (*Brassica oleracea* L. var. *capitata* L. cv. Golden Acre) and leucaena (*Leucaena leucocephela* (Lam.) De Wit) were used in a series of experiments. In each experiment, 25 seeds of the test cultivar were placed in each of five replicate dishes.

In all experiments, the effluent suppressed (Figures 1a and 1b) or delayed germination (Figure 2) with increasing effluent concentrations having greater effects. In the early experiments, the lowest effluent dilution was 6.25%. Although this was more dilute than the successful dilution of Pandey and Soni (1994), later experiments were run with greater dilutions. However, we were still unable to detect any stimulation of germination (e.g. Figure 3).

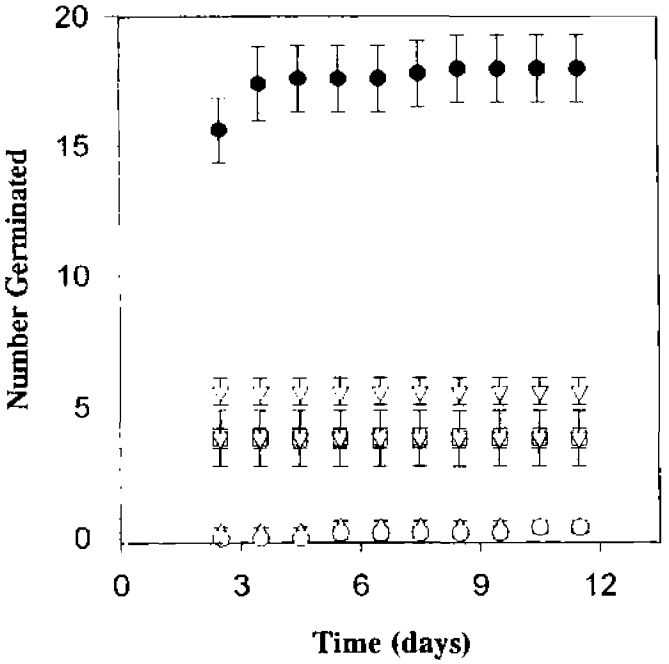

Figure 1a Germination of onion cv. Arad in different dilutions of effluent

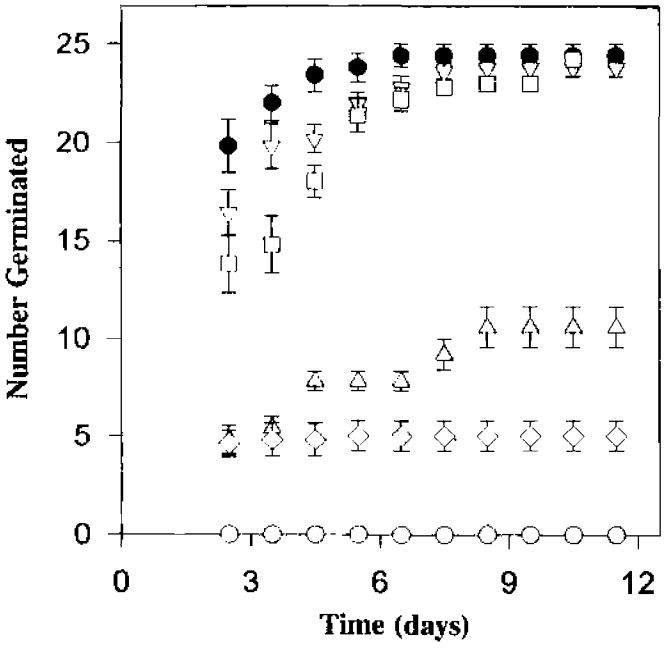

Figure 1b Germination of cabbage cv. Golden Acre in different dilutions of effluent

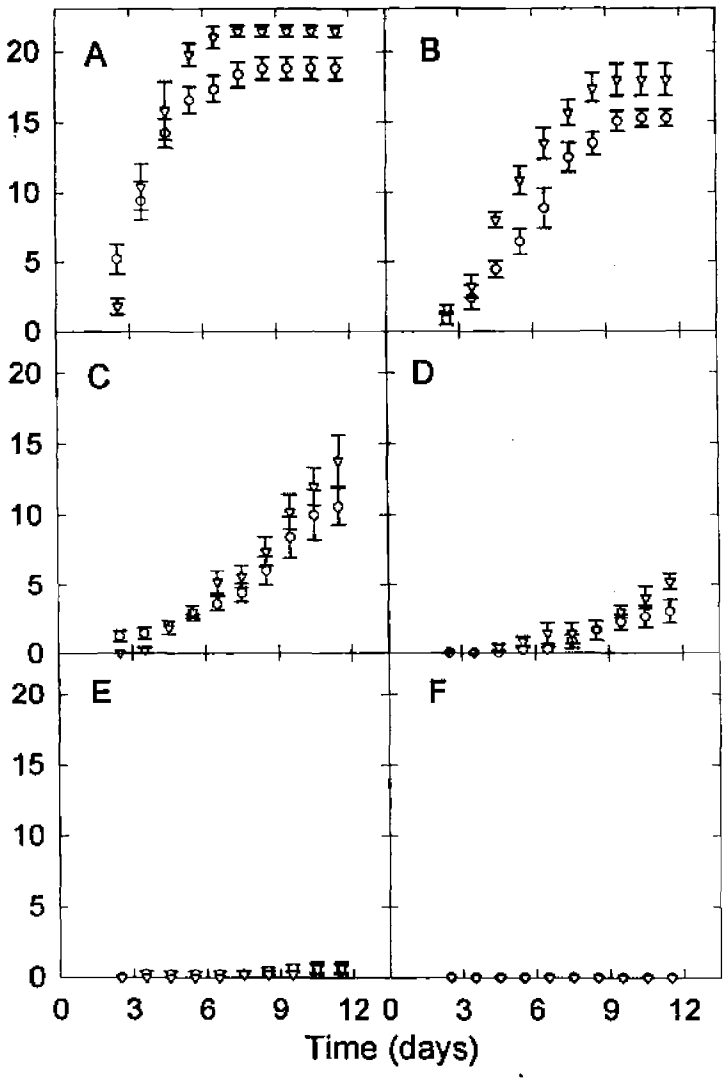

Figure 2 Germination curves for two carrot cultivars in different effluent dilutions (A=0, B=6.25, C=12.5, D=25, E=50 and F=100%) (Circles ='Karoda' triangles = 'Chantenay')

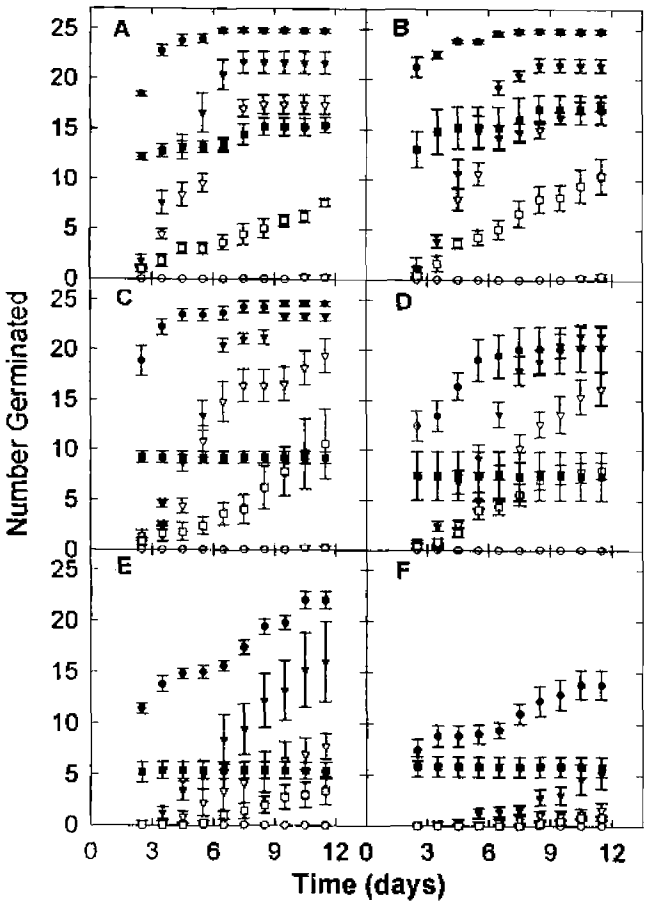

Figure 3 The germination of seeds of different species in diluted effluent (A=0, B=1.25, C=25, D=5, E=10 and F=20%)

REFERENCE

Pandey, D.K. and Soni, P. 1994. Distillery effluent – a potential resource for irrigating forest seed beds. Ambio 23:267–268.